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BEHAVIOURAL RESPONSES TO A WEALTH TAX

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Abstract

In this paper, we review the existing empirical evidence on how individuals respond to the incentives created by a net wealth tax. Variation in the overall magnitude of behavioural responses is substantial: estimates of the elasticity of taxable wealth vary by a factor of 800. We explore three key reasons for this variation: tax design, context, and methodology. We then discuss what is known about the importance of individual margins of response and how these interact with policy choices. Finally, we use our analysis to systematically narrow down and reconcile the range of elasticity estimates. We argue that a well-designed wealth tax would reduce the tax base by 7-17% if levied at a tax rate of 1%.

1. Introduction

The tax revenue which could ultimately be raised from a wealth tax depends not only on the tax rate(s) and pre-existing levels of wealth, but also on how individuals adjust their taxable wealth in response to the tax. Wealth may adjust mechanically, due to capitalization into land and house prices for instance. Individuals may also respond directly to the incentives created, reducing revenue and worsening economic efficiency. Such behavioural responses to wealth taxation can be real or reported. A real response to the imposition of a wealth tax might include a reduction in savings, emigration, or the shifting of wealth into tax-exempt asset classes (even if total wealth does not change). Alternatively, individuals may change their reported wealth by reallocating it within the household, under-reporting, or evading the tax.

In this paper we assess how and why individuals adjust their wealth in response to a wealth tax, particularly focusing on the context of the UK. Crucially, we focus on how responses to a wealth tax would vary with choices made about policy design. These choices influence both the revenue that could be raised, and the efficiency costs of a wealth tax. While in practice policy design will take into account other features, understanding these twin consequences is essential.

We begin by setting out the key quantity of interest – the elasticity of taxable wealth – and what is known about it from existing work studying wealth taxes. This elasticity measures the overall effect of a wealth tax on the amount of taxable wealth, and therefore on the amount of revenue that can be raised. Current estimates vary substantially, and we break this variation down into three key features: policy design and context, which both affect the true elasticity; and methodological approach, which affects the elasticity actually measured. Understanding the implications of each of these helps with interpreting the wide range of results currently seen, and how to map these onto an estimate that might be appropriate for the UK.

To better understand the efficiency implications of a wealth tax, and which policy choices are critical in determining these, we then study specific margins of response. Four key facts stand out. First, when individual declarations are not verified in some way, individuals tend to under-report and manipulate the reported value of their wealth to avoid the tax. Second, individuals adjust their portfolio composition in favour of tax-exempt assets, or assets which facilitate the exploitation of provisions to cap tax liabilities. Third, there is minimal evidence of reduced saving or labour supply in response to a wealth tax, and some evidence suggesting savings increase. Finally, given strong incentives to do so, individuals will also change their reported region of residence within a country to avoid paying a wealth tax, although there is little evidence on international migration.

These responses should not be taken as a given: they are highly dependent on the design of policy. By using evidence on how elastic some margins can be, the UK could design a wealth tax which minimises the extent of such responses, potentially at some higher administrative or political cost. Examples of such choices include:

- Third-party reporting of asset values, to limit the scope for under-reporting (Section 3.1).
- Information sharing arrangements and other enforcement initiatives, to limit evasion (Section 3.2).
- Maintaining a broad tax base (in terms of assets types), which can reduce asset composition responses (Section 3.4).

- Avoiding tax liability caps which are linked to taxable income, as this can create incentives to manipulate income composition (Section 3.4).

- Centralised tax design, which avoids creating incentives to migrate across regions in response to wealth taxation (Section 3.7).

To produce a plausible elasticity for the UK, we consider the range of elasticities found in other countries. Taking each in turn, we consider which margins of response drive the taxable wealth elasticity, and to what extent these might be reduced given the likely design of a wealth tax for the UK. This is necessarily an uncertain process, not least because different margins of response are to some extent substitutable (Slemrod, 1990, 1995). However, our back-of-the-envelope calculations suggest that a well-designed UK wealth tax could achieve an elasticity of taxable wealth with respect to the net-of-tax rate in the region of 7-17 after a period of 4-8 years i.e. the wealth tax base would shrink by 7-17% in response to a 1% tax rate on wealth.

2. Elasticity of taxable wealth

2.1 What are we trying to measure?

The elasticity of taxable wealth tells us to what extent levels of taxable wealth, W, responds to a change in the tax rate, τ. In this paper, we report the elasticity, ε, with respect to the net-of-tax rate on wealth, $1-\tau$. This is the percentage change in reported wealth in response to a 1% increase in the share of wealth kept by an individual after tax in a given year:

$$\varepsilon = \frac{\partial W}{\partial(1-\tau)}\frac{1-\tau}{W}$$

As wealth tax rates are generally around 1%, this can also be interpreted as the percentage decrease in reported wealth in response to a 1pp increase in the wealth tax rate. This number will typically vary based on the time since the tax rate changed, as some responses take time to fully implement, and changes in wealth at a point in time may also affect future accumulation such that the full effect of behavioural responses is not realised immediately.

We could also consider the response of taxable wealth to a change in the net-of-tax *rate of return* on wealth – the amount someone keeps after tax as a share of their *income* from wealth. This effectively compares the value of the tax to the return (or assumed return) on wealth. For example, with a 4% return on wealth, a 1% wealth tax would be equivalent to a 25% tax on the flow of income from wealth ('capital income').

In practice, this equivalence between wealth and capital income taxes may not hold. When the return on wealth differs across individuals, or returns are uncertain, a change in the net-of-tax rate on wealth generates heterogeneous changes in the implied capital income tax rate across individuals, breaking the equivalence between the two concepts.

Behavioural responses to a wealth tax may depend on whether individuals respond to the tax on the basis of its impact on their stock of wealth, or on their flow of income from wealth. If the latter, i.e. individuals respond to a wealth tax as if it is a tax on their capital income, then the elasticity with respect to the net-of-tax rate of return will be more relevant, and we would expect the response to be larger when returns on wealth fall. This is not the only example of how behavioural responses might depend on factors other than the rate and threshold set by tax authorities. We know, for instance, that the salience of taxation matters (Chetty, Looney and Kroft, 2009; Finkelstein, 2009), as does the use of tax withholding (Rees-Jones, 2018; Becker, Fooken and Steinhoff, 2019).

We focus on reported *taxable* wealth, rather than *total* wealth (which includes any non-taxable assets), as this forms the tax base, so determines the revenue implications. This is also the concept of wealth studied in the empirical literature, partly because wealth which is exempt from a wealth tax tends to be absent from the data. However, if not all wealth is taxable, individuals may be able to reduce their tax burden by shifting wealth into exempt assets without changing their total savings (see Section 3.4), maintaining their ability to intertemporally smooth consumption. This will not affect the level of aggregate wealth in the economy but might affect the form in which this wealth is held.

Wealth taxes are usually distortionary, but so are other taxes we might levy to raise revenue. What matters is, therefore, not *whether* we observe distortionary effects in practice, but *how large* these effects are and how the efficiency costs are likely to compare to other tax alternatives. Of course, in addition to efficiency considerations, there are other factors to be

considered when choosing whether and how to tax wealth (see Adam and Miller, 2021, and Summers, 2021, for further discussion).[1] Unfortunately, empirical evidence on the relative efficiencies of tax alternatives is lacking.[2]

It is worth noting that there are some circumstances in which a wealth tax may *improve* efficiency. If individuals respond to a wealth tax by reducing their wealth accumulation, this alone could facilitate redistribution in a context with high capital-skill complementarity (Kina, Slavík and Yazici, 2019; Slavík and Yazici, 2019). Intuitively, if the productivity of high-skilled workers is enhanced relatively more than low-skilled workers by an abundance of capital in the economy, then reducing the amount of capital available could reduce the wage premium paid to high-skilled workers. The alternative approach to redistribution here would be higher income taxes, which may be more distortionary.

Two final points are worth noting regarding the interpretation of estimated taxable wealth elasticities. First, these elasticities do not capture wealth accumulation occurring among individuals with wealth below the exemption threshold, whose saving behaviour may change if they expect that they may one day become eligible to pay. Some studies use these individuals as the comparison group, in which case the taxable wealth elasticity will be downward biased as a result. Others will not be biased, but simply will not capture this kind of response. Second, estimated taxable wealth elasticities depend on multiple margins of response which are to some extent substitutable, and the exploitation of one margin reduces the return to another (Slemrod, 1990, 1995). If enforcement is lax, evasion may be a relatively costless tool for reducing one's effective tax rate. This reduces the incentive to engage in real responses such as reducing one's savings. On the other hand, in an environment with tight enforcement and high tax rates, individuals may choose between reducing their savings, reallocating their wealth portfolios, or migrating with their savings intact. In the subsequent sections, we evaluate the margins of response which appear to be most utilised in different contexts, but the *combination* of responses is also a function of the enforcement environment.

2.2 How does wealth respond to wealth taxation?

Recent studies have provided a small number of estimates of the taxable wealth elasticity (Seim, 2017; Zoutman, 2018; Durán-Cabré, Esteller-Moré, and Mas-Montserrat, 2019; Agrawal, Foremny and Martinez-Toledano, 2020; Brülhart et al., 2020; Jakobsen et al., 2020; Londoño-Velez and Ávila-Mahecha, 2020; Ring, 2020). However, elasticities are not structural parameters, they vary across contexts and are sensitive to policy choices which are highly heterogeneous across countries (see Perret, 2020). Slemrod and Kopczuk (2002) formalise the idea that elasticities can, in effect, be *chosen* by policy makers. As such, it is not possible to directly infer from these studies what the magnitude of overall response in the UK might be. Instead, we examine the findings in the existing literature to understand which contextual and policy factors affect the elasticity, and what lessons the UK can learn from this.

Each study presents a range of elasticity estimates, resulting from the use of alternative specifications. We do not cover each estimate here, but instead focus on the preferred or headline elasticity as chosen by the authors of the respective study. Headline elasticities with respect to the net-of-tax rate in the existing literature vary substantially (Table 1), ranging from 0.054 to 43.2 — a factor of 800! Understanding why this variation exists is key. If the variation exists primarily due to heterogeneous policy choices, the UK ought to take lessons from this.

[1] See also Scheuer and Slemrod (2020a) for a discussion of the broader arguments for and against the taxation of wealth.

[2] For a review of the theoretical arguments surrounding different forms of capital taxation, see Bastani and Waldenström (2020).

Some policy choices which are likely to reduce behavioural responses may be both feasible and desirable in the UK, while others may be harder to implement. If variation in the overall response is largely due to contextual factors, then placing the UK context among the settings for which we have evidence can shed light on how large the magnitude of response is likely to be in the UK. A third explanation for the range in estimates found in the existing literature is methodological. We consider the implications of methodological choices in terms of what effects they estimate when comparing the estimates.

Such variation in taxable wealth elasticities produces wildly different revenue implications. However, even the highest elasticity, estimated by Brülhart et al. (2020) at 43.2, does not imply Laffer revenue effects i.e. the tax revenue gained from an increase in the wealth tax rate still exceeds the revenue lost through behavioural responses. However, since this is based on revenue from the wealth tax, it does not account for effects on other tax bases, such as income tax losses from those who emigrate.

TABLE 1: ESTIMATES OF TAXABLE WEALTH ELASTICITIES IN EXISTING STUDIES

Authors	Country	Elasticities w.r.t. net-of-tax rate on wealth	Time horizon	Approach
Brülhart et al. (2021)	Switzerland	18.2 12.6 36.8 42.5 41.1 43.2	Instant 1 year 2 years 3 years 4 years 5 years	Difference-in-differences
		0.7 (Lucerne) 0.8 (Berne)	N/a N/a	Bunching
Durán-Cabré, Esteller-Moré, and Mas-Montserrat (2019)	Spain (Catalonia)	15.34 32.44	1 year 4 years	Difference-in-differences
Zoutman (2018)	Netherlands	11.6 13.8	1 year 4 years	Difference-in-differences
Jakobsen et al. (2020)	Denmark	8.9 (moderately wealthy) 11.3 (very wealthy)	8 years	Difference-in-differences
		0.3	N/A	Bunching
Agrawal, Foremny and Martinez-Toledano (2020)	Spain	5.8-8.6	4 years	Difference-in-differences
Londoño-Velez and Ávila-Mahecha (2020)	Colombia	2	N/A	Bunching
Seim (2017)	Sweden	0.09-0.27	N/A	Bunching
Ring (2020)	Norway	0.054	N/A	Bunching

2.3 Tax design features driving variation in elasticities

The magnitude of taxable wealth elasticities varies with the design of the tax system (which can be changed), as well as the economic and social context (which cannot be changed in the short run). Tax design features are covered extensively in Section 3, but we briefly describe here three

key design issues which influence the variation in elasticities seen in Table 1. Table 2 provides an overview of the key design features in each country for which we have empirical evidence.

TABLE 2: KEY DESIGN FEATURES IN COUNTRIES WITH EVIDENCE ON RESPONSES TO WEALTH TAXATION

Country	Asset base	Degree of centralisation	Top marginal rate	Third party reporting	Exemption threshold [as percentile of wealth distribution]
Colombia	Financial assets (cash, bank deposits, stocks, bonds, unlisted securities); Real estate (excluding main residence); Large durables; Non-corporate business assets; Assets held abroad; *Less* debt (including inter-personal debts). Exempt: main residence, pensions.	National	6% if wealth > $2.6m USD (in 2010)	**Yes:** most financial assets and mortgage debt. **No:** cash, large durables, unlisted equities, non-corporate business assets, inter-personal debts.	$0.5m USD per individual [P99.88]
Denmark	Financial assets (cash, deposits, bonds, equities); Real estate; Large durables (e.g. cars, boats, aircraft); Business assets; *Less* debts (including inter-personal debts). Exempt: pensions.	National	2.2%, reduced to 1% in 1989 (flat tax).	**Yes:** bank deposits, listed stocks, bonds, mortgages, land and real estate. **No:** cash, large durables, non-corporate business assets, unlisted securities, and interpersonal debts.	Nominal threshold not provided in paper [P97-P99]
Netherlands	Financial assets (stocks, bonds, deposits); Real estate (excluding owner-occupied); *Less* debts (excluding mortgage). Exempt: owner-occupied housing (but imputed rents are taxed separately), pensions, businesses, durables.	National	1.2% (flat tax)	**None.**	$18,000 USD per individual (in 2001)
Norway	Financial assets (deposits, stock, mutual fund holdings, foreign financial assets, private equity); Real estate; *Less* debts. Housing is taxed at discounted market value. Exempt: pensions, durables.	National	1% (flat tax)	**Yes:** financial wealth held through/borrowed from domestically registered financial institutions, real estate, private equity.	$0.2m USD per individual [P88] (in 2015)

Spain	Financial assets (bank accounts, bonds, shares, investment funds, life insurance); Vehicles, boats and aircraft; Art and antiques; Intangible assets (IP rights); *Less* debts (including inter-personal debts). Exempt: elements of historical heritage, pensions, business assets and "closely held" companies, main residences.	Regional	0-3.75% (varies across regions) on wealth above $13.8m; 2.5% in Catalonia	**Yes:** dwellings, financial assets and liabilities held in bank accounts. **No:** consumer durables, business assets, unlisted stocks, inter-personal debts.	$0.9m USD per individual [P99.4 in Catalonia; P99.8 in Spain (2011)]
Sweden	Financial assets (bank deposits, bonds, quoted options, insurance); Real estate; Consumer durables (e.g. cars and boats); *Less* debts. Some assets (stocks, real estate, closely held businesses) were taxed at less than full market value. Exempt: pensions.	National	1.5% (flat tax)	**Yes:** financial and real estate assets and liabilities. **No:** other assets such as consumer durables.	$0.2m per individual [P97] (in 2006)
Switzerland	Financial assets; Real estate; Luxury and durable goods (excluding standard durable household goods); Some voluntary pension savings (a lower limit applies); *Less* mortgage and other debt. Exempt: pensions.	Cantonal and municipal level	0.13-1% (varies across cantons)	**None.**	$25,000 USD - $200,000 USD per individual [P58 and P66 in Lucerne and Bern] (varies across cantons)

Notes: Where reported in local currency only, the exemption threshold is converted to USD using the average exchange rate for the year stated. Note that the tax schedule (rates and thresholds) change over time in all settings. The figures presented in this table reflect what the rates/thresholds were changed *to* as part of the reform used for estimating the elasticity presented in Table 1.
Source: Brülhart et al., 2021; Agrawal, Foremny and Martinez-Toledano, 2020; Jakobsen et al., 2020; Londoño-Velez and Ávila-Mahecha, 2020; Ring, 2020; Durán-Cabré, Esteller-Moré, and Mas-Montserrat, 2019; Zoutman, 2018; Seim, 2017; Agencia Tributaria, n.d.; INE, 2012.

First, taxable wealth elasticities tend to be higher under tax systems which provide greater scope for under-reporting (see Section 3.1). The use of third-party reporting of asset values (by financial institutions for example) is one influential factor (Kleven et al., 2011). The elasticity of taxable wealth is higher in Spain and Switzerland, where there is little or no third party reporting, than in Denmark, where most asset values are reported by third parties (Durán-Cabré, Esteller-Moré, and Mas-Montserrat, 2019; Brülhart et al, 2021; Jakobsen et al., 2020). This is not the only explanation for this difference, but as we describe in Section 4, taking account of tax design features can explain most of the difference in estimated elasticities.

Second, exempting assets from the tax base incentivises individuals to shift their portfolio composition in favour of exempt assets, potentially increasing the magnitude of the overall taxable wealth elasticity (see Section 3.4). In Catalonia, where a 1% reduction in the net-of-tax rate on wealth reduces taxable wealth by 32.4%, we observe substantial shifting of wealth toward exempt business assets and main dwellings (Durán-Cabré, Esteller-Moré, and Mas-Montserrat, 2019). By contrast, the elasticity is much smaller in Denmark (11.3 for the very wealthy), where the wealth tax covered a much broader asset base (Jakobsen et al., 2020). The unequal tax treatment of wealth held in different forms therefore creates distortions through the reallocation of wealth.

Third, wealth elasticities are sensitive to the degree of centralization of the wealth tax. In Spain and Switzerland, both countries with decentralized wealth taxation, inter-regional mobility in response to varying tax rates and exemption thresholds is likely to increase the overall elasticity of wealth. Mobility also encourages tax competition between regions, further eroding revenues (Brülhart et al., 2021; Agrawal, Foremny and Martinez-Toledano, 2020); effects which are frequently a concern among practitioners (Ramallo, 2020). In Switzerland, 17% of the overall response can be explained by inter-cantonal migration (Brülhart et al., 2021); individuals can easily reduce their tax liability by moving to a nearby canton without upending their lives. The large elasticity estimated in Durán-Cabré, Esteller-Moré, and Mas-Montserrat (2019) explicitly excludes migration responses. However, significant reported migration responses to the wealth tax in Spain are found in Agrawal, Foremny and Martinez-Toledano (2020), discussed in more detail in Section 3.7. It is worth noting that these migration responses may reflect real or (only) reported changes in location, though the existing work does not distinguish between these. Even where there are real responses, they may reflect only a partial change in "footprint" by shifting the amount of time spent in different locations.

Other dimensions of tax design may matter for specific margins of response, yet the wealth tax literature has little to say about the importance of these policy choices for the taxable wealth elasticities presented in Table 1. Examples include the enforcement procedures used to minimise under-reporting, the role of individual versus joint taxation of married couples in determining reallocation incentives, and policy choices concerning the tax liabilities of those who migrate.[3] We discuss the potential implications of these policy choices for behavioural responses in Section 3, drawing on evidence from the wider tax literature where applicable.

2.4 Contextual factors driving variation in elasticities

Tax design choices matter for behavioural responses, but so does the context in which a wealth tax reform is implemented. Some evidence suggests that wealthier individuals respond more strongly to wealth taxation than individuals lower down the wealth distribution, though overall the evidence for this is weak (Jakobsen et al., 2020; Zoutman, 2018, Brülhart et al., 2021). If this is the case, countries with a large number of wealthy individuals might expect to observe larger elasticities than countries whose wealth distributions are more equal, for a given tax structure. Between 2013-16, the UK had the 16th highest top 1% wealth share (19.9%) among the 25 OECD countries with available data.[4] On this basis, responses at the top of the distribution may raise the elasticity of taxable wealth in the UK relative to countries with a more equal distribution.

Initial asset compositions will influence the margins of response available to individuals, and hence the overall elasticity. Countries with high shares of housing wealth will face different

[3] Chamberlain (2020) discusses the practicalities of individual versus joint taxation and the incentives created by each, and explores the policy options for taxing those who migrate.
[4] Statistic is based on the most recent year of available data from OECD.stat, as at 31 Aug 2020.

behavioural responses compared to countries with high shares of financial wealth, for instance. Taxes on housing wealth are, in general, harder to avoid than taxes on less observable, more liquid assets. Wealthier individuals also tend to hold a smaller share of their wealth in housing than individuals in the middle of the wealth distribution (Advani, Bangham and Leslie, 2021), suggesting that avoidance opportunities may vary across the wealth distribution. On the other hand, taxes on housing and land are most likely to be capitalised into market values, generating a mechanical effect on wealth.[5] Brülhart et al. (2021) estimate a 20.4% increase in housing wealth (largely explained by increased house prices) in Lucerne, which halved its wealth tax rate from 0.56% to 0.28%, relative to Bern, which cut rates by only 0.1pp (0.74% to 0.64%). Their house price capitalisation effect is largely driven by intra-national migration however (discussed below), generating a stronger capitalisation effect than we might observe in the UK.

The perceived permanence of the tax should, in theory, affect the type and timing of the response. The elasticity of taxable wealth in Catalonia (Spain), may have been larger had the tax been advertised as permanent rather than a temporary 2-year measure (Durán-Cabré, Esteller-Moré, and Mas-Montserrat, 2019). Responses in Colombia are also likely to be affected by the high frequency of wealth tax reforms (Londoño-Velez and Ávila-Mahecha, 2020). These factors are partly a policy choice, but in the absence of being able to tie the hands of successor governments, they depend on individuals' expectations. Behavioural responses to an annual wealth tax are likely to exceed behavioural responses to either a one-off tax, assuming the one-off tax is announced with a past/current census date, or a temporary tax, for which costly adjustments may prove less beneficial.

Empirical evidence suggests that the greater the change in wealth tax rates, the larger the elasticity (Londoño-Velez and Ávila-Mahecha, 2020; Brülhart et al., 2021; Agrawal, Foremny and Martinez-Toledano, 2020). A possible reason for this is that there are fixed costs associated with certain margins of response, either in the form of actual setup costs (e.g. incorporating an offshore entity), or mental costs associated with acquiring knowledge of techniques for avoiding the tax. These costs may only be worth incurring if the change in tax rates is sufficiently large.

It is possible that individuals respond differently to a 'new' wealth tax than to a change in marginal rates under a pre-existing wealth tax. One reason is that a new tax may be more salient, generating larger behavioural responses. This could affect the generalisability of findings based on intensive margin reforms to the debate on the introduction of wealth taxes in other settings. Studies such as Durán-Cabré, Esteller-Moré, and Mas-Montserrat (2019), who study the (re)introduction of wealth taxation in Spain may, for this reason, be more informative on the question of a UK wealth tax than studies such as Brülhart et al. (2021) and Jakobsen et al. (2020) who study intensive margin variation in wealth tax rates.

Finally, the direction of the tax reform may matter for the magnitude of response. It is not clear that behavioural responses to a reduction in wealth tax rates should be symmetrical to a (numerically equivalent) increase in the tax rate. For example, individuals may be able to increase their spending (reduce their wealth accumulation) in response to an increase in tax rates faster than they can increase their savings (increase their wealth accumulation) in response to a reduction in tax rates. Gifting responses are also plausibly asymmetrical: if

[5] House price capitalisation has been observed in the UK in the context of other property taxes. Rosenthal (1999) estimates that one third of the change in local property tax liabilities associated with the replacement of Domestic Rates with the Community Charge (in 1990) was capitalised into house prices. Stamp Duty Land Tax has also been found to induce statistically significant house price responses (Best and Kleven, 2018). Though these mechanical effects have no efficiency implications, some individuals may end up in negative equity as wealth taxes are capitalised into (lower) house prices.

individuals gifted their wealth in response to a wealth tax, it seems unlikely they would request it back in the event of a reduction in tax rates.

2.5 Methodological differences driving variation in elasticities

Methodological differences also generate variation in the observed magnitude of taxable wealth elasticities. Different approaches can yield different estimates even if the true elasticity remains unchanged. There are two common approaches to estimating taxable wealth elasticities: 'bunching' techniques, and 'difference-in-differences', which we describe briefly here.

Bunching techniques exploit discontinuous changes in the tax rate at a particular wealth threshold. These create an incentive for individuals to target the value of their wealth such that they sit on the lower-rate side of the threshold. We can measure the magnitude of individual responsiveness by computing the amount of 'excess mass' at the threshold, i.e. how many more individuals do we observe at the threshold relative to what we would expect if the wealth distribution were smooth? The taxable wealth elasticity can then be calculated by comparing the excess mass to the magnitude of the incentive to bunch, which is determined by the change in tax rates at the threshold (see Section 2.1).

Difference-in-difference methods compare the evolution of wealth between two groups of individuals who are differentially affected by policy change, typically a tax reform. For example, suppose a wealth tax reform increased the tax rate above a particular threshold, with no change in the tax rate below the threshold. After the reform, those above the threshold have an incentive to reduce their wealth, while individuals below the threshold do not (though as noted earlier, their incentive to accumulate further wealth is affected). As long as wealth for the two groups would have followed a similar trend in the absence of the reform, we can attribute a change in the wealth gap between the two groups to the change in tax incentive faced by those above the threshold. A test of the plausibility of this "common trends" assumption is typically provided by showing whether wealth trends for the two groups were similar prior to the reform. The elasticity can be computed by comparing the magnitude of the change in wealth gap to the magnitude of the tax change.

Bunching techniques produce elasticity estimates which are local to the threshold level of wealth. Estimates of taxable wealth elasticities which are representative at the threshold are unlikely to be representative of the average individual above the threshold (indeed they are likely to be smaller). For the wealthiest individuals, targeting their reported wealth to just below the exemption threshold is simply not an option, unless the threshold is sufficiently high. These individuals must therefore respond along one of the many margins not captured by bunching estimates (e.g. portfolio adjustment, reduced saving, or migration).

Bunching estimates of wealth tax elasticities are commonly thought to capture reported – rather than real – responses (Durán-Cabré, Esteller-Moré, and Mas-Montserrat, 2019; Brülhart et al., 2021; Jakobsen et al., 2020). This is because it is difficult for individuals to precisely target the actual market value of their assets at a particular point in time. Reported responses (such as the under-reporting of self-reported assets) can be more easily manipulated to exploit bunching incentives, provided there is scope to do so given the tax design. Bunching could also be achieved by reallocating wealth across family members if these individuals are taxed as separate units, though the indivisibility of some assets may constrain this response. While individuals can (and do) retime their income receipts to exploit kinks in the *income* tax schedule (Miller, Pope and Smith, 2019), it is not generally possible to time wealth holdings in this manner. Opportunities to bunch are therefore fewer in the context of wealth taxation, with the possible

exception of trusts if these were to be treated as separate units for the purpose of administering a wealth tax (see Chamberlain, 2020).

Overall, it seems unlikely that bunching estimates can provide much information on the magnitude of comprehensive responses to wealth taxation. They capture a limited range of responses and are specific to individuals with relatively low levels of taxable wealth. It is perhaps not surprising that bunching elasticities tend to be close to zero given that the incentive to manipulate reported wealth (and risk potentially large penalties) is likely to be small relative to the tax saving incentive for individuals in the vicinity of the exemption threshold, in the contexts studied in the existing literature.

However, bunching estimates may provide useful information on behavioural responses to a specific optional element of tax design: banded valuations. Rather than taxing based on a continuous measure of net wealth, which would require a precise valuation, the tax liability could be determined based on the range – or 'band' – in which an individual's net wealth is situated. Such a valuation approach offers administrative benefits (see Daly, Hughson and Loutzenhiser, 2021 and Troup, Barnett and Bullock, 2020), but provides strong bunching incentives for individuals on the boundary of a wealth tax band, whose tax liability could be significantly reduced by reporting their wealth on the lower side of the boundary. Elasticities based on bunching could provide a useful measure of the efficiency cost of this valuation approach.

Banded valuations create 'notches' – discontinuous changes in an individuals' effective average tax rate and liability across some threshold – at the boundaries of each band. For example, the current UK Annual Tax on Enveloped Dwellings (ATED) charges no tax on properties owned by a company and worth less than £500,000, but £3,700 in tax on properties valued between £500,000 and £1 million (see Summers, 2021 for details). This creates a 'notch' at £500,000: an individual's tax liability jumps from £0 to £3,700 when the value of their (enveloped) property crosses the £500,000 threshold. This creates strong incentives to have a value just below, rather than just above, the threshold.

Such notches also exist when average tax rates change discontinuously for other reasons. For example, prior to Dec 2014, purchasers of UK homes paid 1% Stamp Duty Land Tax (SDLT) on the full value of a purchase between £125,001 and £250,000, but nothing below £125,000. This 'slab' structure again created strong incentives not to transact just above the threshold. It was reformed to move SDLT to a 'slice' structure of charges, with a tax of 2% on the value of the property above £125,001 for a purchase between £125,001 and £250,000. This discontinuous change in *marginal* rates (while the average tax rate and liability change continuously) is described as a 'kink'. Notches give rise to stronger bunching incentives than kinks, and could be more salient among taxpayers. This may partly explain why the bunching elasticity for Colombia is higher than in Sweden, Denmark, Norway, or Switzerland (Londoño-Velez and Ávila-Mahecha, 2020; Jakobsen et al., 2020; Seim, 2017; Ring, 2020; Brülhart et al., 2021), and may provide an indication of the taxable wealth response we would observe within the vicinity of each threshold if a banded valuation approach were adopted.

Brülhart et al. (2021) identify a taxable wealth elasticity of 43.2 for Switzerland in their cantonal-level difference-in-difference analysis of aggregate wealth, and 0.7-0.8 using bunching methods applied to microdata for two specific cantons (Lucerne and Bern). This stark difference in estimates is perhaps less surprising given that bunching can only capture a limited range of responses: it will not capture migration responses for instance. It is also important to note that since wealth is highly skewed, we may expect different responses when individuals are weighted individually (as in the microdata approach) than when individuals are weighted proportionally

to wealth (as Brülhart et al., 2021, implicitly do in their aggregate analysis), if elasticities are systematically related to wealth.

Besides the bunching estimates, the sizes of other elasticity estimates depend on what their underlying methodology enables them to capture. Difference-in-difference studies which use a balanced panel of individuals residing in the country before *and* after a tax reform do not capture the international migration response (Zoutman, 2018; Jakobsen et al., 2020). Durán-Cabré, Esteller-Moré, and Mas-Montserrat (2019) use a balanced panel of taxpayers residing in Catalonia and thus measure the overall taxable wealth response of 'stayers', missing migration to other Spanish regions or abroad. In contrast, the taxable wealth elasticity in Agrawal, Foremny and Martinez-Toledano (2020) isolates the effect of inter-regional migration on taxable wealth in Spain, excluding other behavioural responses, [6] thus explaining (in part) the large difference between these estimates.

If behavioural responses tend to be greater among wealthier individuals, overall taxable wealth elasticities are also likely to be sensitive to the exemption threshold. However, the exemption threshold affects both where in the wealth distribution the tax base starts, as well as the incentive for individuals above the threshold to adjust their behaviour. The lower the exemption threshold, the larger the tax base and the harder it is to avoid wealth taxation altogether. Bringing moderately wealthy individuals into the tax base may also reduce the magnitude of the *average* response. On the other hand, the lower the exemption threshold, the higher the tax burden on the very wealthy (holding the rate constant), and hence the stronger the incentive to avoid the tax.

Real responses take time to implement and overall behavioural responses will therefore only be realised in the long-run. Jakobsen et al. (2020) estimate the magnitude of the taxable wealth response over an 8-year period and calibrate a life-cycle model in order to simulate the long-run response. Their empirical evidence suggests that the effects of the 1989 Danish wealth tax cut on household savings grow over the study period and do not dissipate after 8 years. Their model implies that the response to a permanent wealth tax cut only flattens off after 25 years. The 30-year elasticity of taxable wealth with respect to the net-of-tax rate is estimated to be 30 for moderately wealthy households and 45 for very wealthy households.[7] However, one limitation of their approach is that the model attributes the entire response to changes in real behaviour, whereas the reduced-form estimates are likely to capture reporting responses too, and these could evolve quite differently. Brülhart et al. (2021), in comparison, observe a plateauing response after only 3 years.

2.6 How do wealth tax elasticities compare to other taxes?

While the literature on the taxation of wealth holdings is still small, it is instructive to compare taxable wealth elasticities to what is seen for other taxes. Taxable wealth elasticities are, on the whole, larger than estimated elasticities with respect to one-off taxes on bequests, which range

[6] Their taxable wealth elasticity is based on the stock of wealth in each region before and after migration responses to the reintroduction of the (decentralised) wealth tax. However, the stock of wealth in a region after the reform is based on fixing the wealth of 'stayers' at its pre-reform level and then adding for each region the pre-reform wealth of individuals who relocate there. The only behavioural response driving the taxable wealth elasticity is thus the migration response, since the wealth for each individual is not able to respond.

[7] Jakobsen et al. (2020) estimate the effects of a 1pp reduction in the marginal rate for moderately wealthy taxpayers, and a 1.45pp reduction in the marginal rate for the very wealthy. To obtain approximate elasticities w.r.t the net-of-tax rate, we divide the 65% change in wealth w.r.t a 1.45pp reduction in the tax rate (1.45% increase in the net-of-tax rate) by 1.45 to obtain an elasticity of 45.

from 0.1-0.2 (Kopczuk, 2013). Responses to bequest taxation, which is levied once in an individual's lifetime, are however difficult to compare with responses to an annual wealth tax.

Translated into an elasticity with respect to the net-of-tax rate of return, the taxable wealth elasticity estimates are generally higher than previously estimated capital income elasticities. The elasticity of 43.2 identified in Brülhart et al. (2021) translates into a capital income elasticity of 1.05, higher than the 0.1-0.4 capital income elasticity estimate for Denmark (Kleven and Schultz, 2014) or 0.7 for France (Lefebvre, Lehmann and Sicsic, 2020). Elasticities with respect to the net-of-tax rate of return are, however, sensitive to assumptions on the rate of return.[8]

The conversion of taxable wealth elasticities into capital income elasticities also depends on the prevailing capital income tax rate. To illustrate, we convert our preferred range of taxable wealth elasticities for the UK (7-17) presented in Section 4, to capital income elasticities using two initial values for the prevailing capital income tax rate: 20%, which is close to the UK tax rate on capital gains; and 40%, which is close to the additional rate of tax paid on dividends. Under the lower capital income tax rate, a wealth elasticity of 7-17 translates to a capital income elasticity of 0.3-0.5 assuming a 4.5% return on capital,[9] or 0.2-0.4 assuming a 3% rate of return. The respective ranges under the higher capital income tax rate are 0.2-0.5 and 0.1-0.3. These are closer to existing estimates for capital income elasticities in the literature.

3. Margins of response

In evaluating the feasibility of Senator Elizabeth Warren's wealth tax proposal for the US, Saez and Zucman (2019) employ a taxable wealth elasticity of 7.5, calculated by averaging the estimated elasticities from four of the above studies (Brülhart et al., 2021; Seim, 2017; Jakobsen et al., 2020; and Londoño-Velez and Ávila-Mahecha, 2020). Given the sensitivity of elasticity estimates to context, policy and methodology, this elasticity figure is somewhat arbitrary. We take a systematic approach by evaluating the importance of different margins of response in other contexts and considering the likely importance of these responses in the UK.

Evaluating the magnitude of different margins of response is an important exercise in its own right, since each margin is associated with different revenue implications and policy prescriptions. Some responses have broader implications for other tax bases. If wealthy individuals migrate, we lose not only their wealth tax revenue but also revenues from taxing their income, for instance. We emphasise the key policy choices that ought to be carefully considered as part of a wealth tax proposal for the UK.

3.1 Under-reporting

Given the incentive and opportunity to do so, individuals may under-report the value of their assets (or inflate the value of their debts) in order to reduce their wealth tax liability. Individuals

[8] The elasticity in Brülhart et al. (2020) falls to 0.7 when a rate of return of 3% is assumed (rather than 4.5% which is used to compute the 1.05 elasticity estimate).

[9] Assuming a rate of return of 4.5%, a 1 percentage point increase in the wealth tax rate is equivalent to a 1%/4.5% = 22.2 percentage point increase in the capital income tax rate. If the capital income tax rate is initially 20%, the net-of-tax rate on capital is 80%. Thus, a 22.2 percentage point increase in the capital income tax rate implies a 22.2/80 = 28% increase in the net-of-tax rate. Since a taxable wealth elasticity of 7 implies that a 1 percentage point increase in the wealth tax rate reduces taxable wealth by 7%, this suggests that an equivalent 28% increase in the net-of-tax rate on capital must reduce wealth by 7%. The capital income elasticity is therefore 7%/28% ≈ 0.3 to one decimal place.

could under-report at the extensive margin by failing to declare all of their assets, or at the intensive margin by under-reporting the value of declared assets.

For this kind of response, administration and valuation are the key elements of tax design determining its extent. Administrators require knowledge of which assets are held by individuals (and other related entities).[10] Here, the use of third-party reporting or registers can minimise the scope for extensive margin misreporting. Reliance on the self-reporting of wealth as a valuation approach invites under-reporting at both the extensive and intensive margin, particularly if enforcement is (perceived to be) weak (Kleven et al., 2011). Third-party reporting prevents this type of avoidance but is not always feasible for all assets.

In settings with little or no third-party reporting, under-reporting appears to be a significant margin of response. In Switzerland, Brülhart et al. (2021) estimate that 50% of the overall taxable wealth elasticity (21.6 after 5 years) can be attributed to changes in reported financial assets, only a small proportion of which (1.3% of the aggregate response) is due to the voluntary disclosure of offshore assets. The authors attribute the remainder to changes in evasion behaviour, with individuals exploiting the lack of third-party reporting.[11] Using household survey data, they estimate that income derived from wealth responds positively to a reduction in wealth tax rates, suggesting that individuals are encouraged to reveal their wealth previously hidden. Bunching estimates, which are generally thought to reflect reported, rather than real responses, appear to be larger in Switzerland (0.7 in Lucerne and 0.8 in Bern) than in other contexts, suggesting that some combination of avoidance and evasion could be more prevalent in Switzerland than elsewhere, even lower down the wealth distribution.

Estimating the extent of under-reporting more directly, Seim (2017) compares the value of self-reported assets in Sweden (mostly cars), with registry data on car values which was not utilised by tax administrators. Close to the exemption threshold, under-reporting appears to be rife; 75-80% of taxpayers valued assets at less than their true value. Under-reporting can account for around one third of the (relatively small) bunching estimate, with an implied taxable wealth elasticity due to under-reporting of 0.03-0.09.

In Colombia, wealthy business owners who bunch at tax notches are found to reduce their reported inventories (which are not subject to third-party reporting) by 22% (Londoño-Velez and Ávila-Mahecha, 2020). Assets whose values are reported by banks and financial institutions are not under-reported in this way. Individuals who bunch partly do so by inflating their liabilities, by 35% on average, with no evidence suggesting that this 'debt' is used to finance additional assets. These interpersonal debts, which are deductible, are not subject to third-party reporting, highlighting the need for verification of assets and liabilities.

Though under-reporting appears to be fairly common in contexts relying on self-reported valuations, the magnitude of the problem in the UK will depend crucially on the feasibility of different approaches to valuing assets. Advani (forthcoming) highlights the importance of third-party reporting in the context of income tax compliance in the UK. Similar results have been found in other countries e.g. Kleven et al. (2011) in Denmark; Phillips (2014) in the US; Clifford and Mavrokonstantis (2019) in Cyprus. Given the level of under-reporting when third-party reports are not used, it is clear that – where possible – it would be sensible to use them. Some

[10] Troup, Barnett and Bullock (2020) discuss the tools available to administrators in the UK.

[11] It is possible that some of this is driven by actual changes in financial wealth holdings if individuals shift wealth into exempted assets, although the Swiss wealth tax is broad based so we do not expect asset shifting to be a sizeable response. Transfers of ownership could also explain some of the response, if the reduction in tax rates triggered a reverse in the fragmentation of assets or held back planned transfers.

assets might feasibly be reported by third parties. In this case, under-reporting will be confined to assets for which third-party reports are not available.

Even in the absence of third-party reporting, under-reporting responses could be minimised by strict enforcement procedures. Auditing could play an important role here. Advani, Elming and Shaw (forthcoming) show in the UK that auditing can have a positive dynamic impact on individual income tax compliance, as once someone's actual income has been established, it is difficult for them to under-report this in future years. For wealth, where changes may be more predictable, this positive effect of auditing may be even more pronounced.

Imposing a wealth tax could also have a positive spill-over effect on compliance with other taxes, because tax authorities could use wealth tax returns to cross-check income tax and capital gains tax returns. This reduces the administration costs for those existing taxes, and increases the expected receipts from those taxes.

3.2 Offshore evasion

Causal evidence on the effect of wealth taxation on offshore evasion - the deliberate under-reporting or hiding of wealth overseas - is scarce. Nevertheless, there is mounting evidence on the extent of offshore evasion practices among the wealthy in the U.S. (Guyton et al., 2020) and Scandinavia (Alstadsæter, Johannesen and Zucman, 2019a), and further evidence suggesting that taxation induces offshoring responses (Londoño-Velez and Ávila-Mahecha, 2020; Hanlon, Maydew and Thornock, 2015; Kemme, Parikh and Steigner, 2017; Johannesen, 2014). Evidence on offshore avoidance – the legal use of tax rules which allow some offshore wealth holdings to go untaxed – is even harder to come by, and we do not discuss this issue at length.[12] In many cases offshore avoidance is indistinguishable from changes in the asset composition of an individual's wealth portfolio to include more non-taxable wealth (see Section 3.4).

The concentration of offshoring practices among the wealthy makes this a potentially significant margin of response to wealth taxation. If the very wealthy can evade the tax, this could very quickly erode a substantial proportion of the tax base. The top 0.01% of Scandinavian taxpayers are estimated to evade around a quarter of their total tax liability through offshore evasion, with evaders hiding 40% of their true wealth abroad, an estimate based on evidence from data leaks (Alstadsæter, Johannesen and Zucman, 2019a). Meanwhile, Spanish wealth tax payers who *chose* to disclose offshore assets during the 2012 tax amnesty were hiding 30% of their net worth, on average (Mas Montserrat and Mas Montserrat, 2019).

The European Commission estimates UK offshore wealth to be 8.7% of GDP in 2016, (Vellutini et al., 2019, Table 3). Much of this wealth may be properly declared to tax authorities,[13] but the potential revenue implications where individuals fail to do so are substantial. HMRC (2019) note that wealthy individuals in the UK "often have complex tax affairs covering multiple kinds of taxes, and have greater choice than most people about how to manage their income and assets", and highlight their use of offshore jurisdictions.

In Colombia, offshore evasion is identified as a primary margin of response among wealth tax payers (Londoño-Velez and Ávila-Mahecha, 2020). Using tax data linked to leaked information

[12] By "avoidance", we include what lawyers refer to as "mitigation". Whether individuals are able to legally reduce their tax burden by holding wealth in offshore financial institutions is a matter of tax design. A broad-based wealth tax which covers all worldwide assets would not enable tax *avoidance* (legal) through offshoring, but individuals could still engage in tax *evasion* (illegal), at a cost.

[13] Indeed in the UK, individuals who are resident but not domiciled in the UK are legally incentivised to hold wealth offshore, rather than in UK located assets.

on offshore accounts located in Panama (the 'Panama Papers'), they find that individuals incorporate offshore entities and use these to reduce their reported assets by 7.7% in years in which these assets would result in a wealth tax liability. Opportunities to use offshore structures for tax evasion purposes are likely to be more ample in Colombia than in the UK, and the magnitude of the response clearly depends on the enforcement environment. The UK already has infrastructure in place to manage the tax affairs of high net worth individuals and reduce non-compliance (the Wealthy unit), so tax gaps arising from evasion are likely to be smaller than in Colombia (which has no Wealthy unit equivalent). However, the Colombian evidence highlights that a wealth tax does substantially affect the incentive to engage in offshore evasion, even if the opportunities to do so are country-specific.

Information exchange initiatives, such as the exchange of information on request (EOIR) and automatic exchange of information (AEOI), can have an impact on offshore deposits (Hanlon, Maydew and Thornock, 2015; Heckemeyer and Hemmerich, 2018; Beer, Coelho and Leduc, 2019; O'Reilly, Parra Ramirez and Stemmer, 2019; Johannesen et al., 2020), though not always on tax compliance as some individuals simply shift assets to non-cooperating havens (Johannesen and Zucman, 2014; Menkhoff and Miethe, 2019). Voluntary disclosure programmes, such as the Liechtenstein Disclosure Facility in the UK, encourage some to declare unpaid capital and income taxes from offshore investments to tax authorities (HMRC, 2016), and have successfully improved tax compliance in other contexts (Mas Montserrat and Mas Montserrat, 2019; Alstadsæter, Johannesen and Zucman, 2019b; Johannesen et al., 2020; Londoño-Velez and Ávila-Mahecha, 2020). They also highlight the extent of non-compliance that was taking place before the scheme was introduced. Efforts to tackle evasion will play an important role in deterring evasion responses to wealth taxation. New technologies, such as machine learning methods to detect tax evasion based on wealth tax returns, could present opportunities which enhance the feasibility of enforcing wealth taxation in the 21st Century (Mas Montserrat and Mas Montserrat, 2019). Then again, new technologies may also be used to develop novel evasion strategies.

One concern might be that if enforcement initiatives prevent the wealthy from being able to evade taxes, they would instead opt to avoid their wealth tax liability by legally manipulating their wealth portfolios. Alstadsæter, Johannesen and Zucman (2019b) estimate that enforcement efforts encouraging the disclosure of offshore assets in Norway resulted in a 30% rise in taxes paid by those who disclosed. Disclosers were concentrated at the top of the income distribution, making up 2% of the top 1%; 6% of the top 0.1%; and 11% of the top 0.01%. The increase in taxes paid persisted over time, suggesting that legal and illegal forms of tax avoidance are not as substitutable as some might fear, at least in contexts with a broad tax base.

3.3 Gifts and fragmentation

Rather than transferring assets overseas, wealthy individuals may respond to wealth taxation by legally transferring assets into someone else's name. This could involve genuine inter vivos giving, potentially as a substitute for bequests transferred on death. This imposes a real cost on the donor, who sacrifices benefit from and control of the assets. Alternatively, individuals may transfer assets into the name of their spouse or children while potentially retaining effective control (also known as 'fragmentation'), with or without retaining some benefit.[14] This would

[14] Individuals could transfer legal ownership to spouses or minor children but retain control over and continue to benefit from the assets. Alternatively, individuals in the UK could fragment their wealth by splitting assets into trusts, transferring legal ownership and benefit but retaining some control over how the assets are used. Whether this confers a tax advantage depends on the tax design.

minimise the overall tax burden on the household if the assets owned by some family member place them in a lower (or nil rate) tax band.

The primary policy choices determining this margin of response are the use of individual versus household taxation, the exemption threshold and overall progressivity of the tax schedule, and the tax treatment of gifts. Taxing at an individual, rather than household level, creates opportunities for the reallocation of assets toward household members facing a lower marginal tax rate. Married couples in the United Kingdom have, in the past, responded to incentives to reallocate assets among themselves. The transition from joint to independent income taxation in 1990 prompted significant intra-spousal asset shifting (Stephens and Ward-Batts, 2004). Assets were reallocated such that investment income accrued to the spouse with the lower marginal tax rate. However, the majority of households did not fully exploit this opportunity to reduce their tax liability.

Tax rate thresholds and the overall progressivity of the tax schedule also affect incentives and opportunities to gift. The more progressive the tax schedule, the greater the tax advantages that can be obtained by transferring wealth to those facing a lower marginal rate. In contrast, under a tax schedule featuring a low exemption threshold and flat tax rate, the opportunity to gift may be limited by the smaller number of individuals whose own wealth places them in the nil rate band. Under such a tax, gifting would have minimal impact on the tax liability of those with wealth well in excess of the nil rate band, reducing the incentive to gift among the ultra-wealthy.

Very wealthy individuals may be best placed to take advantage of the opportunity to gift, since they can maintain a high standard of living while sacrificing benefit and control over some of their assets (effectively making early bequests). An alternative method of gifting, however, is to transfer legal ownership while retaining effective control and benefit (e.g. by transferring to one's spouse). This is associated with a risk of losing the assets if the relationship breaks down. Unfortunately, the existing literature does not help us to distinguish between these types of giving, or who is most likely to engage in each. Alternative opportunities to fragment, such as the splitting of assets into multiple trusts or family investment companies, could also be a potential cause for concern (Chamberlain, 2020), though again the existing literature does not help us establish this.

Gifting responses to wealth taxation will depend on the tax treatment of these transfers. While substantial gifts to children (and other relatives except spouses) made within 7 years of death are chargeable to inheritance tax in the UK, gifts between spouses are exempt. This exemption encourages transfers of ownership, if the tax were levied at an individual level, which would reduce the tax yield without necessarily increasing the spread of wealth across households. More broadly, the UK tax system does little to discourage inter vivos transfers of cash providing the donor survives long enough, which could increase their appeal as a response to wealth taxation, though inter vivos gifts of other assets are subject to Capital Gains Tax.

Exploiting the reintroduction of wealth taxation in Catalonia, Durán-Cabré, Esteller-Moré, and Mas-Montserrat (2019) identify a positive gifting response; a 1pp increase in the average tax rate increases the probability of making a gift by 2.7pp, though this effect dissipates after two years. This modest response may be partly due to the fact that gifts are taxable under Spanish law. The interaction of wealth taxation with gift and inheritance tax is important as it can affect both the level and timing of tax revenues (see Summers, 2021, for more information on the interaction between these taxes). For example, if wealthy individuals respond to wealth taxation by increasing gifting, this may reduce the level of bequests chargeable to inheritance tax upon death. This would affect future tax revenues and reduce the wealth tax revenue collected in the present, which is unlikely to be fully offset by an increase in tax collected on gifts (in the UK at least).

Empirical evidence suggests that individuals do adjust the *timing* of their gifts in response to changes in the relative tax advantages of giving and bequeathing (Bernheim, Lemke and Scholz, 2004; Joulfaian, 2005, McGarry, 2000). Joulfaian (2005) estimates that a 10% drop in the price of gifts relative to bequests raises the probability of making a gift by 4.3pp, and the level of gifts by 29%. However, in responding to various tax incentives, people tend to give too little relative to what they ought to give if their sole objective was minimising the tax liability on their wealth transfers (Joulfaian and McGarry, 2004; McGarry, 2000, 2001; Poterba, 2001) or household income (Stephens and Ward-Batts, 2004).[15] Small responses to tax incentives may be due to the desire to maintain control over one's assets until death (Kopczuk, 2007), though some evidence suggests that this cannot be the only explanation (Goupille-Lebret and Infante, 2018). If individuals wish to maintain control over their wealth, gifting responses to wealth taxation may be smaller than responses to inheritance tax incentives observed shortly before death. In the UK, there is evidence of a broad lack of awareness over the inheritance tax treatment of inter vivos gifts (Dolton et al., 2019), which could partly explain why tax incentives are not fully exploited.

3.4 Asset composition

Individuals unwilling or unable to avoid wealth taxation through reallocation within the household might instead minimise their tax liability by reallocating their wealth across different asset classes. Erosion of the tax base through asset composition responses, generally arising due to the tax base being narrowed by exemptions and reliefs, contributed to the arguments for repealing wealth taxation in several OECD countries (see Perret, 2020). Findings of portfolio composition responses to tax incentives are common, not only in the wealth tax literature, focused on taxes on the stock of wealth (Alvaredo and Saez, 2009; Durán-Cabré, Esteller-Moré, and Mas-Montserrat, 2019; Ring, 2020; Zoutman, 2015), but also with regards to estate taxation – taxes on the transfers of wealth at death (Kopczuk, 2007; Poterba and Weisbenner, 2003), and capital income taxation – taxes on the returns from wealth (Alan et al., 2010; King and Leape, 1998; Poterba and Samwick, 2003).

Asset composition responses can only be used as a means of avoiding wealth taxation to the extent that some assets offer a tax advantage over others, increasing the 'plasticity' of the tax base (Scheuer and Slemrod, 2020b). Exempting some assets altogether from wealth taxation clearly incentivises individuals to hold wealth in those forms. However, other types of tax advantage can also induce behavioural responses (Durán-Cabré, Esteller-Moré, and Mas-Montserrat, 2019, see below). Shifting the form in which wealth is held is not a frictionless process and assets are often held in one form or another for reasons other than tax minimisation (most individuals live in the houses they own, for example), so the magnitude of this response is an empirical question.

Durán-Cabré, Esteller-Moré, and Mas-Montserrat (2019) estimate that in Spain, a 1pp increase in the average wealth tax rate resulted in an 18.1pp increase in the share of exempt assets over a 4-year period. There was a 9.6pp increase in the share of exempt business assets, and a 0.6pp increase in the share of exempt main dwellings. *Total* reported wealth (which excludes most exempted assets) did not change in response to the wealth tax. In fact, wealth accumulation increased if we assume that tax liabilities were paid out of the total wealth stock. This suggests that their *taxable* wealth elasticity of 32.4 may be driven almost entirely by asset composition responses. Over a 4-year period, this figure implies a revenue loss equivalent to 2.6 times the

[15] Kopczuk (2013) reviews the literature on intergenerational transmission responses to inheritance tax incentives.

forecasted annual wealth tax revenue. Exempting assets can, it seems, have extremely large revenue implications.

Exempting certain assets can create horizontal inequities as not all individuals have equal access to different forms of wealth. Indeed, Durán-Cabré, Esteller-Moré, and Mas-Montserrat (2019) find that individuals are much more responsive in their portfolio reallocation if they own a relatively high share of wealth in the form of business shares. If wealthier individuals have disproportionate access to tax-advantaged assets (as is the case in many countries, including Spain), this creates the risk of an intentionally progressive wealth tax becoming regressive. This process became one of the arguments contributing to the abolition of the Swedish wealth tax in 2006 (Waldenström, 2018). Alvaredo and Saez (2009) also identify a substantial asset shifting response to the exemption of stock for owner-managers in Spain in 1994, which "gradually and substantially eroded the wealth tax base". Individuals responded by increasing their share of stock in companies they owned or increasing the share of labour and business income derived from the business in order to fulfil the criteria for a tax exemption.[16]

In Spain, we also observe an increase in the share of assets which are not themselves exempt, but which provide alternative opportunities to avoid the tax (Durán-Cabré, Esteller-Moré, and Mas-Montserrat, 2019), and there is some evidence of a similar response in France (Chamberlain, 2020). The share of listed equity and investment funds in Spain rose by 11.5pp in response to a 1pp increase in the average tax rate. As a solution to liquidity concerns, Catalonian legislation limits an individual's total income and wealth tax liability to 60% of their taxable income—similar legislation exists (or used to) in France, Sweden, and some Swiss Cantons (OECD, 2018; Du Rietz and Henrekson, 2014). Individuals can exploit this by manipulating capital gains realisations; long-term capital gains do not count in the taxable income calculation. Shifting wealth into assets producing returns in the form of capital gains thus enables the individual to avoid taxation. While dealing with liquidity issues is a necessary consideration in the design of wealth taxation (see Loutzenhiser and Mann, 2020), evidence from Spain suggests that solving this issue through a tax ceiling can induce unintended behavioural responses. Note that the fiscal effects of this kind of response go beyond wealth tax revenues; shifts in income composition also affect income tax revenues. Such a response could have a significant impact on tax revenues in the UK in particular, where capital gains are currently taxed at a much lower rate than income in other forms.

Evidence from other capital taxes also finds portfolio shifting responses to be important. Kopczuk (2007) finds that the onset of a terminal illness induces "deathbed" estate planning in the U. S., including the disposal of business assets and collectable and valuables upon which estate tax is due.[17] Estate tax planning has also been shown in the Netherlands (Suari-Andreu et al., 2019) and Norway (Kvaerner, 2019). Such tax planning is likely to be less widespread in the context of an annual wealth tax as individuals can less easily manipulate their taxable assets year-on-year. This is one argument in favour of taxing wealth annually rather than at death.

An alternative reason for shifting asset compositions in response to wealth taxation is differences in valuation methodologies. Assets which are difficult to value, such as private businesses and those traded in thin markets, might be reported to tax authorities with some

[16] Eligibility required the individual to own at least 15% of the business, or the family at least 20%. It also required the individual to derive over 50% of his/her labour and business income from this business activity.

[17] The specific responses of individuals to estate taxation will depend on the tax design. For example, in the UK, keeping and passing on business assets is more tax efficient as this attracts a CGT uplift (taxes on gains made over a lifetime are wiped out) and business property relief (no inheritance tax is due on these assets).

discretion, enabling individuals to reduce their overall tax burden. Evidence for the UK suggests that private businesses are concentrated at the top of the wealth distribution, with business assets accounting for around 10% of the wealth holdings of the wealthiest 10%, compared to less than 1% at the median (Advani, Bangham and Leslie, 2021). This pattern is reflected elsewhere, including in Norway (Fagereng et al., 2021), France (Garbinti, Goupille-Lebret and Piketty, 2020), Spain (Martínez-Toledano, 2020), and the US (Smith et al., 2019). This suggests that wealthier households are particularly well positioned to benefit from ambiguity over the value of their assets.

Bjørneby, Markussen and Røed (2020) argue that this incentive to shift toward hard-to-value assets can explain why higher wealth tax liabilities lead to an *increase* in small business investment in Norway, where the tax value of unlisted shares is typically well below market value.[18] Though portfolio reallocation reduces the tax yield, the evidence from Norway suggests that this particular margin of response can have a positive effect on employment. Poterba and Weisbenner (2003) also provide evidence consistent with this margin of response in the context of estate taxation in the US: individuals switched toward hard-to-value asset classes whose values are easier to manipulate for tax purposes.

The problem of valuing hard-to-value assets applies to any form of asset-based taxation, such as inheritance tax or the UK's Annual Tax on Enveloped Dwellings. Some countries have responded to this issue by excluding or offering favourable treatment of these assets in their wealth tax base, which often contributed to a sense of unfairness (Kopczuk, 2019). It would not be possible to prevent individuals from reporting the lowest of a range of plausible asset values. Third party reporting is not an option for these assets. and professional valuations – such as those obtained for inheritance tax purposes – can return a range of legitimate estimates. However, exempting hard-to-value assets altogether in order to avoid such reporting responses would create even stronger incentives for asset shifting than those created by valuation methods which allow for some discretion.

One response which may be particularly relevant in the case of a wealth tax, but for which we have little empirical evidence, is the use of debt as a means of reducing one's tax liability. An individual's tax liability, when levied on *net* wealth, could be artificially reduced by taking on additional debt, particularly 'soft' loans which impose little cost on the borrower.[19] Taking out a loan does not, on its own, reduce an individual's tax liability. However, individuals can then reduce their tax liability by investing the funds in tax exempt or tax advantaged assets. Evidence from a capital income tax reform in Denmark suggests that households significantly reduced their mortgage debts in response to a phase-out of debt deductibility, suggesting that debt holdings are responsive to tax incentives (Alan and Leth-Petersen, 2006). Wealthier individuals, with disproportionate access to credit markets, may be most likely to pursue this option. Careful choices regarding the type of debts which can be deducted are therefore needed to minimise the risk of erosion of the tax base. Some countries allow only for the deduction of debt taken on to purchase taxable assets, with the exception of student debt which is also deducted (e.g. Sweden). Where debts are self-reported, there is a risk that individuals may inflate their liabilities, as Londoño-Velez and Ávila-Mahecha (2020) find in the Colombian context.

Most jurisdictions levying a wealth tax choose to exempt pension assets from taxable wealth. One concern is that individuals may respond by shifting wealth into pension funds. On this, we have no direct empirical evidence. However, Chetty et al. (2014) study the implications of

[18] Positive income effects – the incentive to save more overall to cover future tax liabilities – could also contribute to explaining the positive effect on business investment in Norway.

[19] `Soft' loans are loans offering low interest rates (typically below the market rate) and possibly other benefits such as long and flexible repayment periods and interest holidays.

subsidies for retirement accounts on savings patterns. They find that 15% of the population are "active savers", who respond to the increased tax advantage on pensions by shifting their savings into retirement accounts; the total value of savings does not change. These "active savers" tend to be wealthier and more financially savvy than individuals who do not adjust their saving behaviour. This has three implications for a wealth tax. First, including pension assets in the tax is unlikely to discourage retirement saving, since this is not very responsive to tax. Second, excluding pensions from such a tax is likely to induce a minority of individuals to shift more of their savings into pensions.[20] Third, individuals who do respond are likely to be relatively wealthier, reducing the progressivity of the tax.

Exempting assets can also affect the mechanical response of wealth to wealth taxation. Exempting main homes, for instance, could induce an asset shift toward real estate. This could augment the house price capitalisation effect as homes would be tax advantaged relative to other assets. On the other hand, an increase in house prices relative to the price of other assets would, to some extent, act to temper this effect.

Asset composition responses can be minimised by maintaining as broad a tax base as possible. Exempting assets creates clear incentives to avoid taxation through shifts of asset composition, and this is likely to entail broader fiscal effects (on income tax revenues, for instance). Alternative tax advantages implicitly bestowed on certain assets, which can arise as unintended consequences of solutions to liquidity concerns or valuation difficulties, may also induce shifts in asset composition, though the effects of these are likely to be smaller than the effects of exempting assets altogether.

3.5 Savings

Given limited opportunities to adjust the structure of asset holdings to avoid a wealth tax, individuals may, instead, adjust the total value of their asset holdings. The argument that wealth taxation reduces the incentive to save has played a role in the decline in wealth taxes in OECD countries (see Perret, 2020). As the theoretical argument goes, the imposition of a tax on wealth reduces the return on saving, encouraging individuals to spend more (or work less) today, and put less aside for the future. In practice, there is little empirical evidence of substantial savings responses to wealth taxation in other countries, and mixed evidence on savings responses to other tax incentives.

Even from a theoretical perspective, it is not clear that wealth taxation has a negative behavioural impact on saving. Substitution effects arising from the diminished rate of return negatively affect savings incentives. However, individuals also experience an income effect: they are incentivised to save more to compensate for the erosion of their future wealth unless the imposition of a wealth tax is offset by other tax cuts or spending increases that make individuals paying the wealth tax no worse off overall. This theoretical argument has furthered the case for a positive tax rate on capital (Straub and Werning, 2020). Empirical evidence from the wealth tax literature suggests that savings responses are small (Durán-Cabré, Esteller-Moré, and Mas-Montserrat, 2019; Seim, 2017; Brülhart et al., 2021), possibly even positive in some contexts (Ring, 2020).

Some papers find small reductions in saving rates. Seim (2017) directly estimates saving responses to wealth taxation using a difference-in-differences approach, finding economically negligible and statistically insignificant effects. Neither taxable savings nor exempt pension contributions respond to wealth taxation in Sweden. In Switzerland, Brülhart et al. (2021) argue

[20] Such a response may be dampened if there are provisions which limit pension contributions in other ways, such as an annual or lifetime cap as exist in the UK.

that had individuals saved/invested their tax savings resulting from the tax rate cut, this could explain 5.7% of the aggregate taxable wealth response. Yet, the observed savings response explains only 4.3%, suggesting that individuals consume some of their 'mechanical' tax savings and do not increase actual saving in response to a reduction in wealth tax rates.

In some contexts it appears income effects dominate, with total wealth rising. In Spain, Durán-Cabré, Esteller-Moré, and Mas-Montserrat (2019) find little evidence of changes in total wealth (though *taxable* wealth is reduced) in response to the reintroduction of wealth taxation. If anything, total wealth increases in responses to the tax after accounting for mechanical effects, potentially consistent with strong income effects. Ring (2020) finds that wealth taxation in Norway tends to have a *positive* effect on yearly household saving in a setting where evasion responses are muted. He finds that for each additional Norwegian Krone subject to a 1% wealth tax, households increase their yearly saving by 0.04 NOK – four times the amount needed to pay the tax and maintain the same level of wealth. This increase in savings is financed primarily through increased labour supply. Ring's findings support strong income effects in the Norwegian context; those with wealth initially below the exemption threshold respond less strongly than households with wealth above the exemption threshold, for whom the income effects are greater.

More broadly, evidence on the responsiveness of wealth accumulation to tax incentives is mixed. Responses to tax incentives for retirement savings tend to be small on average and are often confined to a minority of 'active' savers, who tend to be wealthier than those who are less responsive (Attanasio and DeLeire, 2002; Attanasio, Banks and Wakefield, 2005; Antón, Muñoz de Bustillo and Fernández-Macías, 2014; Chetty et al., 2014; Paiella and Tiseno, 2014). Other studies find positive, but often modest, responses to an increased incentive to save for retirement (Hubbard and Skinner, 1996; Poterba, Venti and Wise, 1996; Benjamin, 2003; Rossi, 2009; Gelber, 2011; Beshears et al., 2017). Estate and inheritance taxes are found to have negative, but generally modest, effects on wealth accumulation (Holtz-Eakin and Marples, 2001; Kopczuk and Slemrod, 2001; Joulfaian, 2006; Goupille-Lebret and Infante, 2018). Overall, it seems that individuals' saving behaviour may be less influenced by tax incentives than the predictions of frictionless life-cycle models of optimal behaviour would imply.

3.6 Labour supply

If individuals were to save more, they could do this either by reducing their consumption or increasing their labour supply. Through its effect on the return to saving, wealth taxation thus affects the labour leisure trade-off. Though we have no empirical evidence on the effect of wealth taxes on the labour supply response, we do observe the effect on labour *income* in a number of contexts, which should be positively correlated with hours worked.

Brülhart et al. (2021) find no earnings response to wealth taxation in Switzerland, nor does Seim (2017) find any significant effect in Sweden. In contrast, Ring (2020) identifies a small positive effect of wealth taxation on taxable labour income in Norway: for each additional NOK subject to the wealth tax, households increase annual taxable labour income by 0.01 NOK. The cumulative effect of increased labour income in Norway explains at least half of the cumulative savings effect over a 5-year period. By contrast, in Spain taxable income reduces in response to the reintroduction of wealth taxation (Durán-Cabré, Esteller-Moré, and Mas-Montserrat, 2019). However, this is likely due to changes in income composition as individuals shift towards capital gains in response to the tax liability cap, rather than to reduced incentives to finance wealth accumulation.

The lack of labour supply response is unsurprising given that many individuals are unable to flexibly adjust their labour supply in the short run. Overall, empirical evidence shows that labour

supply responses to marginal tax rates (typically income taxes) tend to be small (see e.g. Saez, Slemrod and Giertz, 2012, for a review). If responses to income tax incentives are small, it would perhaps be odd to find that wealth taxes, which only indirectly affect the return to hours worked, have a significant effect on labour supply. Wealth taxes also raise revenue from some groups of individuals where we are particularly unlikely to observe a response in terms of labour supply. First, wealth is disproportionately skewed toward the top of the age distribution, and retirees are only able to adjust labour supply on the extensive margin. Since this is likely to be more costly, they are less likely to respond. Second, wealth is disproportionately held by business owners (Advani, Bangham and Leslie, 2021), who receive much of their remuneration in the form of dividends or capital gains. These individuals may respond, but it would not be observed from studying their labour income.

For the very wealthy, entrepreneurial risk-taking may be a more relevant margin of response than hours worked. One way in which wealth taxation may discourage entrepreneurship is by reducing the net return to entrepreneurial activity.[21] In a difference-in-differences analysis, Hansson (2008) studies the effect of wealth taxation on self-employment in OECD countries, identifying negative, but economically modest, effects. By contrast, Bjørneby, Markussen and Røed (2020) show that investments in small businesses increased in response to wealth taxation in Norway, although this is largely because business owners had an incentive to increase investment (particularly human capital investment) in businesses which are taxed favourably relative to other assets (see Section 3.4).

Guvenen et al. (2019) argue that, in theory, a wealth tax may be *better* at encouraging entrepreneurship than a capital income tax. A wealth tax taxes the stock of wealth, regardless of the rate of return, whereas a capital income tax is paid only on the flow of income generated by an asset. A capital income tax therefore taxes high returns (which may reflect entrepreneurial talent) at the same rate as low returns, whereas a wealth tax implies a lower effective tax rate on the income flows of entrepreneurs who generate high returns.[22] However, there is little empirical evidence on the effects of a wealth tax on entrepreneurship among the very wealthy.

3.7 Migration

The emigration of wealthy individuals is commonly regarded as a threat to efforts to tax wealth, especially in an age of increasing globalisation and high-skilled mobility. This argument has contributed to the decline of wealth taxes in OECD countries (Perret, 2020). Wealth taxation may also put off wealthy foreigners from moving to the UK, with broader economic implications. We assess the validity of this concern with reference to existing evidence on migration responses to wealth, estate and inheritance, and income taxation. On balance, the existing evidence suggests that migration responses to all forms of taxation are small relative to potential revenue, and there is little support for the view that the emigration of wealthy taxpayers poses a significant threat to progressive taxation.

As with taxable wealth elasticities, estimates of migration responses to taxation are highly contextual. Migration elasticities are sensitive to the size of the initial base and the ease of mobility. For this reason, within-country elasticities tend to be higher than one might expect in an international setting. In Spain and Switzerland, we have direct evidence on inter-regional

[21] Wealth taxation may also affect levels of entrepreneurship by reducing the pool of capital available for financing.

[22] Model details are important here. In a related paper, Boar and Knowles (2020) find that capital income taxes should still be preferred to wealth taxes. We do not compare the models directly here; we merely note that empirical evidence is essential in this context, where differing model assumptions can deliver quite different conclusions.

mobility responses to wealth taxation, which in both contexts is substantial.[23] Agrawal et al. (2020) identify wealthy individuals flocking to Madrid following the reintroduction of the Spanish wealth tax in 2011, with Madrid serving as an internal tax haven. Using variation in tax rates across Spanish regions, they estimate an elasticity of the stock of taxpayers with respect to the net-of-tax rate of 7.9. Though substantial, this response is driven almost entirely by the status of Madrid as an internal tax haven which offers a top marginal rate of 0% compared to a minimum top rate of 2.5% in other regions; individuals do not respond to smaller variations in tax rates across jurisdictions, where top marginal rates vary by 1.25pp at most. The authors find that the pattern of responses is consistent with reported, rather than real, changes in location, which may be harder to accomplish at an international level. For example, the UK already has strictly defined criteria for when an individual is considered "tax resident" (see Chamberlain, 2021 for further discussion). This suggests that while the use of tax havens may be a critical margin of response (see Section 3.2), actual migration responses are small.

In Switzerland, Brülhart et al. (2021) estimate that 24% of the overall taxable wealth elasticity is accounted for by migration, with 17% reflecting migration *within* Switzerland. Moving across cantons is less cumbersome than migrating internationally, and the small size of Swiss cantons is likely to imply larger relative responses than would be applicable at a national level as individuals can relocate while retaining the same job, language, and so on. Brülhart et al. (2021) also find that a further 20% of the aggregate response can be attributed to house price capitalization, which is indirectly caused by mobility. In sum, this implies that 34% of the (large) taxable wealth elasticity is induced by intra-national mobility (Brülhart et al., 2019).[24] These responses are therefore likely to be much higher than one would see in the context of a nationally levied UK wealth tax. It is possible however, that if individuals could not migrate across cantons to avoid the tax, we would observe a higher proportion migrating abroad.

Recent evidence suggests that international migration responses to wealth taxation are very small indeed. Jakobsen et al. (2021) estimate the migration response to three Scandinavian wealth tax reforms: the 1988 wealth tax cut in Denmark which reduced the marginal tax rate from 2.2% to 1%; and the abolition of the wealth taxes in Denmark (1996) and Sweden (2007), which cut the marginal tax rate from 1% and 1.5%, respectively, to zero. In both settings, a 1 percentage point reduction in the tax rate reduced the probability of out-migration among wealth tax payers by around -0.1 percentage points. This implies an elasticity of the stock of wealth tax payers of around 4.3, almost half the inter-regional migration response observed in Spain. The study also finds an anticipatory response: individuals with wealthy fathers – who presumably expect to inherit in future – become less likely to emigrate following the reduction of the wealth tax. Overall, despite clear evidence of international migration responses to wealth taxation, these responses are far too small to result in serious revenue effects.

Evidence on mobility responses to estate and inheritance taxation suggests that the location choices of older, wealthy individuals are relatively inelastic (Bakija and Slemrod, 2004; Conway and Rork, 2006; Brülhart and Parchet, 2014). This is true even in contexts where inter-regional, rather than international migration is likely to be the primary response. The exception is Moretti and Wilson (2020), who find significant mobility responses among billionaires to heterogeneity

[23] At a national level, migration can erode the tax base in two ways. The first is the emigration of wealthy individuals, which is the focus of the current discussion. However, where taxes are levied at a sub-national level, tax differentials across regions also incentivises migration to lower tax jurisdictions within the same country, reducing the total tax revenue which is collected across all regions. This is illustrated clearly in Spain, where 5% of wealth tax revenue is sacrificed through internal tax-induced migration (Agrawal, Foremny and Martinez-Toledano, 2020).

[24] This figure is calculated assuming that international migration accounts for a quarter of the house price capitalization effect. See Brülhart et al. (2019) for more detail.

in estate and inheritance taxation across US states. However, this appears to be largely driven by migration to the San Francisco area. Although California does not have an estate tax, this migration is likely to be motivated by the location of the tech industry rather than estate tax considerations. Migration responses to a tax which is levied only once, upon death, cannot easily be compared to responses to an annual wealth tax. On the one hand, being subject to a *recurrent* wealth tax may provide a stronger incentive to migrate. On the other hand, individuals may weigh estate and inheritance tax considerations more highly in their location choices nearer the end of their life, and respond accordingly, given that they are able to reside wherever they like during their lifetime.

Personal income taxes are generally found to induce small although statistically significant responses among wealthy taxpayers, with the elasticity of the stock of wealthy taxpayers ranging from 0.03 to 2 (see Kleven et al., 2020, for a review). This implies a 1% reduction in the net-of-tax rate on income (for example an increase in the average income tax rate from 20% to 20.8%, which reduces the net of tax rate by 0.8pp from 80% to 79.2%) leads to a 0.03-2% reduction in the number of wealthy taxpayers. Again, responses are highly sensitive to context and the size of the initial base. Studies of international mobility tend to find an elasticity of the stock of rich foreign taxpayers close to one, and an elasticity of the stock of rich domestic taxpayers close to zero (Muñoz, 2020; Akcigit, Baslandze and Stantcheva, 2016; Kleven, Landais and Saez, 2013; Kleven et al., 2014). This lends some support to the argument that taxation could damage a country's ability to attract rich taxpayers from abroad.[25] However, Muñoz (2020) estimates the elasticity of rich taxpayers to personal income taxation across European countries and finds that the foreign elasticity in the UK is well below the European average,[26] suggesting that discouraging wealthy foreigners may be less of a concern in the UK than in other contexts. Recent evidence also suggests that high income migrants in the UK (many of whom are also likely to feature at the top of the wealth distribution) are heavily concentrated in the finance industry where there are strong agglomeration externalities (Advani et al., 2020). Such taxpayers may be less responsive to tax incentives than wealthy migrants in other contexts, as their mobility is constrained by the location of their work.

To the extent that migration responses to a UK wealth tax could pose a threat, this could be offset by policy choices. Limiting an individual's ability to escape the tax by emigrating, by continuing to tax them for a minimum period after departure for instance, could prevent an immediate leakage of the tax base (see Chamberlain, 2020).

[25] Anecdotal evidence suggests that the reintroduction of a Spanish wealth tax may have discouraged wealthy foreign migration into Spain, except to Madrid (Ramallo, 2020).

[26] Using the lower bound estimate, the United Kingdom has a smaller foreign elasticity (0.635) than Austria, Belgium, Denmark, Italy, Luxembourg, Netherlands, Poland, Portugal, Spain and Switzerland, is equal to Germany, and higher than France. The European average is 0.673. Using the upper bound estimate, the United Kingdom has a smaller foreign elasticity (1.46) than all of these countries, relative to a European average of 1.61.

4. What can the UK learn from this?

Estimating the amount of revenue that a UK wealth tax could collect is vital for the current debate. If a wealth tax were to ultimately raise very little revenue, it may not be worth the administrative and political cost of imposing one. Revenue calculations must account for potential behavioural responses, which result in actual taxable wealth diverging from estimates of the current stock as presented in Advani, Bangham and Leslie (2021). However, as this paper shows, quantifying the elasticity of taxable wealth and the magnitude of individual margins is far from straightforward. The elasticity is highly dependent on context and policy design, while the different methodological approaches used in previous studies capture different types of response. To produce a plausible elasticity estimate for the UK, we consider which margins drive the taxable wealth elasticity in different contexts, and to what extent these might be reduced under a well-designed wealth tax.

For revenue modelling, it is the cumulative effect of all behavioural responses which is relevant. As discussed in Section 2.5, elasticity estimates based on bunching capture only a limited range of response margins and individuals. However, as discussed in Section 2.5, bunching estimates are still valuable for revenue analysis, as they indicate the taxable wealth response we might expect to see around tax rate thresholds and, in particular, the potential efficiency costs of adopting a banded valuation approach. For now, we focus on the studies which produce more comprehensive estimates of the taxable wealth elasticity (Brülhart et al., 2021; Jakobsen et al., 2020; Durán-Cabré, Esteller-Moré, and Mas-Montserrat, 2019; Zoutman, 2018).

A UK-wide wealth tax would not give rise to the inter-regional tax competition and mobility observed in Switzerland, nor the house price capitalisation resulting indirectly from this mobility (Brülhart et al., 2021). Brülhart et al. (2019) estimate that intra-national mobility could account for around 34% of the aggregate taxable wealth elasticity. Shutting off this effect reduces their net-of-tax elasticity to 28.5 after 5 years.

Brülhart et al. (2021) argue that changes in the reported value of financial assets could explain as much as 50% of their taxable wealth elasticity (i.e. 21.6), which they attribute to changes in evasion behaviour facilitated by a lack of third-party reporting. A well-designed wealth tax which makes extensive use of third-party reporting could shut off much of this response.[27] If both the inter-regional migration response and the reporting response were shut down, this would reduce the Swiss elasticity to just 6.9. Even if only half of the reporting response could be shut down, this would bring the elasticity down to around 17.7.

Little is known about which margins of response drive the elasticity estimates in Denmark and the Netherlands (Jakobsen et al., 2020; Zoutman, 2018). In the Netherlands, simultaneous reforms to other parts of the tax system make it difficult to conclude that the estimated elasticity in Zoutman (2018) only reflects responses to the wealth tax reform. Jakobsen et al. (2020) note that in Denmark, most assets are third-party reported, limiting opportunities for under-reporting. Denmark also maintained a broad tax base, suggesting that asset composition responses may have been less pronounced than in the Spanish context below, and did not have regional variation in wealth tax structure. Consistent with this, the Danish elasticity is estimated

[27] It is possible that a small proportion of the financial wealth response is driven by shifts in asset composition (see Section 3.1). Conversely, it is possible that a small proportion of the *Catalan* response – discussed subsequently – is driven by evasion (see section 3.4). However, a wealth tax which maintains a broad base and makes extensive use of third-party reporting would address both of these possibilities.

to be 8.9 for moderately wealthy individuals (11.3 for very wealthy individuals), close to the Swiss elasticity (6.9) when internal migration and reporting responses are shut down.

However, the Danish elasticity estimate does not capture any international migration responses, which a comprehensive estimate of the UK elasticity would ideally incorporate. Agrawal, Formeny, and Martinez-Toledano (2020) estimate a taxable wealth elasticity which isolates the impact of inter-regional migration, which we expect to be above the effect induced by international migration. Simply adding their elasticity estimate of 5.8 to the Danish elasticity would imply an upper bound of around 17.1 for the very wealthy, close to the Swiss elasticity when we shut down half of the reporting effect (17.7). This highlights that the elasticities produced for both Denmark and Switzerland are much more consistent with one another than they first appear to be, once differences in methodology and tax design are accounted for.

In Catalonia, portfolio shifts toward tax-advantaged assets are identified as a key margin of response (Durán-Cabré, Esteller-Moré, and Mas-Montserrat, 2019). In fact, while the authors identify a taxable wealth elasticity of 32.4 after 4 years, *total* wealth including exempted assets does not respond at all to the reintroduction of the wealth tax, with an elasticity of -2 which is statistically insignificant. This suggests that asset composition responses drive almost all of the taxable wealth response. The implication for the UK is that, under a broad-based wealth tax which treats all assets equally, so shuts down this margin, overall behavioural responses (here excluding international migration) could be very small. However, it is worth noting that a likely reason why the response is so small here is the temporary nature of the tax, which was due to last only two years.

Having never had a comprehensive wealth tax, it is hard to be certain how individuals would respond to a UK wealth tax. The scope for such responses would clearly depend on policy design. The evidence from other countries suggests that a well-designed wealth tax which covers all assets and makes extensive use of third-party reporting could achieve an elasticity in the region of 7-17 after a period of 4-8 years, depending on assumptions made about the size of international migration responses. This implies that a 1% wealth tax could reduce the tax base by 7-17%. The ideal wealth tax from the point of view of minimising behavioural responses would feature a broad base, equal treatment of asset classes, extensive use of third-party reporting, exit charges (or similar) to discourage migration, robust enforcement procedures, and be levied at the household level.

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